# FINAL 303(d)

# LIST FOR KENTUCKY

OCTOBER, 1992

Department for Environmental Protection

Division of Water

Pursuant to Section 303(d) of the Clean Water Act, the State of Kentucky has developed a final list of waterbodies presently not supporting applicable water quality standards. As required by 40 CFR 130.7(b)(4), these waterbodies have been prioritized for total maximum load (TMDL) development. The purpose of this report is to identify the impacted streams, describe efforts being made to address the sources of the problems, and prioritize streams for total maximum daily load (TMDL) activities.

Preliminary 303(d) lists were submitted to USEPA and made available to the public for comment in April, 1992. Press releases were sent to major newspapers and notification was also made in the Environmental Quality Commission's newsletter and the quarterly publication "Land, Air, and Water" of the Natural Resources and Environmental Protection Cabinet. No official comments were received. The lists have now been prioritized for TMDL development. The waterbodies chosen as "High Priority" are targeted for TMDL development in the next two years (by the 1994 305(b) biennial reporting period).

The lists of waters not meeting standards were derived primarily from the "1992 Kentucky Report to Congress on Water Quality" (Kentucky Natural Resources and Environmental Protection Cabinet, 1992) and "Assessment of Water Quality Conditions, Ohio River 1990-1991" (ORSANCO, 1992), hereafter referred to as "305(b) reports." Monitored instream data from the Kentucky Division of

Water (Division), Ohio River Valley Water Sanitation Commission (ORSANCO), U.S. Geological Survey (USGS), and Louisville and Jefferson County Metropolitan Sewer District (MSD) ambient monitoring stations were the primary basis for listing. Other special studies were used in the assessment. Bacteriological data were collected not only on a regular basis at ambient stations, but at numerous other stations in the upper Salt River, North Fork Kentucky River, and lower Licking River basins. Data from studies prior to 1989 on the South Fork Licking River, Elkhorn Creek, Big Sandy River, and Little River were carried over to this reporting period. Dissolved oxygen studies were performed in the Floyds Fork, East Fork Little Sandy River, and Mayfield Creek basins in the summer of 1991. Biological studies were performed at 18 ambient stations and during five intensive surveys over the two-year reporting period. Data gathered from 45 previous biological surveys were also used where conditions have remained largely unchanged since the time of the surveys. Another source of information was from conservation officers of the Department of Fish and Wildlife Resources, who completed questionnaires regarding habitat and fishery conditions in numerous unmonitored streams in the state.

Water quality data were compared with their corresponding criteria. All of the criteria except fecal coliform were used to assess warmwater aquatic habitat (WAH) use support. If the criteria for dissolved oxygen, un-ionized ammonia, temperature, or

pH, collected during the period of October 1989 through September 1991, were exceeded in greater than 25 percent of the measurements, the segment did not support its use for WAH.

Data for mercury, cadmium, copper, lead, and zinc were analyzed for violations of acute criteria listed in state water quality standards using three years of data (from October 1988 through September 1991). The segment was not supporting if one or more exceedences were measured at quarterly or less frequently sampled stations, or two or more exceedences occurred at stations sampled monthly.

Fecal coliform data were used to indicate degree of support for primary contact recreation (swimming) use. Primary contact recreation was not supported if the criterion was exceeded greater than 25 percent of the time based on 2 years of monthly data collected during the recreation season. In addition, streams with pH below 6.0 units caused by acid mine drainage were judged to not support this use. Domestic water supply use was not assessed because the use is applicable at points of withdrawal only and could not be quantified in the format required by the guidelines.

In areas where both chemical and biological data were available, the biological data were generally the determinate factor for establishing warmwater aquatic habitat use support status. This is especially true when copper, lead and zinc

criteria were contradicted by biological criteria. The Division made this decision in recognition of the natural ability of surface waters to sequester metals and make them less bioavailable and therefore less toxic.

The biological assessments were done by means of selected community metrics for fish, macroinvertebrate, and diatom communities, and habitat and physicochemical characteristics. A waterbody did not support its designated uses if the biological community was severely altered (dominated by pollution-tolerant organisms, had very high or low biomass, or possessed other significant functional alterations), or habitat characteristics were severely impacted.

A total of 139 segments on 121 streams and 6,738 acres on nine lakes did not support designated uses for the reporting period (Tables 1, 2 and 3). The most common cause of nonsupport in streams was fecal coliform contamination. In lakes, dissolved oxygen depletion caused by excessive nutrients was the primary cause of use nonsupport.

Sanitary wastewater (municipal) point source discharges were solely responsible for or contributed to nonsupport of swimming because of fecal coliform contamination in 53 segments on 42 streams. Municipal is defined as all point source discharges of sanitary wastewater for 305(b) reporting purposes, which includes

small package treatment plants as well as discharges from city treatment plants. Agricultural inputs were primarily or secondarily responsible for this use nonsupport in 41 segments on 30 streams. Stormwater runoff, combined sewer overflows (CSOs), septic tank seepage, urban runoff, and land disposal were named as the source of fecal coliform bacteria in 28 segments on 19 streams.

Municipal inputs were the primary or secondary source for 23 segments on 21 streams and three lakes that did not support aquatic life because of organic and/or nutrient enrichment (DO problems). Eleven of these waterbodies are also listed for bacterial contamination.

Mining activities were solely or partially responsible for 22 waterbodies not supporting uses, primarily because of low pH (acid drainage) and siltation. Petroleum operations were the source of chloride (nine waterbodies) and oil and grease (two waterbodies) problems in eleven streams. Industrial discharges were identified as the source of pollutants causing use nonsupport in only five waterbodies. Two waterbodies were listed because of priority organics, two for both nutrients and chlorides, and one for chlorides only.

Metals were the cause of nonsupport in eighteen streams; municipal discharges were the metals source in five of these streams. On the Ohio River, metals contributed to use nonsupport

on seven waterbodies (Table 2). The cause of the listing was usually copper. A segment was classified as not supporting its aquatic life use only when the metal data were corroborated by biological data. Otherwise, every waterbody on the Ohio River would have been listed as not supporting aquatic life use because of copper.

The lists of streams not supporting designated uses show that many of the problems are caused by inadequate disinfection of sanitary wastewater, resulting in instream levels of bacteria that pose a health risk to body contact recreational users. These problems are expected to gradually diminish as wastewater treatment plants are upgraded across the state, sewer systems become available to areas that are presently unsewered, and appropriate BMPs for animal waste control are installed.

Some streams are affected by municipalities with combined sewer systems. These systems cause problems when sufficient rainfall occurs to overload the capacity of combined sanitary and storm sewer systems, resulting in untreated discharges from overflow points throughout the systems. ORSANCO identified CSOs as the primary contributor to bacteria problems in the Ohio River downstream of major municipalities (see Table 2). Twenty-seven municipalities on the Ohio River, seven of which are in Kentucky, have combined sewer systems. Ten combined sewer systems have been identified on other streams in Kentucky. All these municipalities

are or will soon be required by their KPDES permits to begin identifying discharge points, dry weather discharges, and mitigation measures. Dry weather discharges are to be completely eliminated. Kentucky will focus on combined sewer systems according to their number, size, and contribution to water quality problems. Technology-based controls will consist of: 1) proper operation and regular maintenance; 2) maximum use of existing collection systems for storage, review and modification of pretreatment programs; 3) steps to maximize flow to publicly-owned treatment works for treatment; 4) prohibition of dry weather flows; and 5) control of solids and floatable material. Additional control measures will be required as necessary.

Agriculture is the second most frequent source of pollutants causing use nonsupport. Besides contributing to fecal coliform contamination, agriculture was identified as the source of excessive siltation and/or nutrient enrichment in nine waterbodies and five lakes.

Runoff from agricultural activities is categorized as nonpoint source (NPS) pollution. The Division established a NPS Section in 1987 under Section 319 of the 1987 Amendments to the Clean Water Act to coordinate water quality efforts with the U.S. Department of Agriculture (USDA) and State agencies. The charge of the NPS Section is to prioritize problem areas, monitor the effects of BMPs, provide educational resources, and distribute monies to be

used on demonstration farms. Controls for NPS pollution are still largely voluntary; however, Federal price subsidies can be withheld if farm plans are not followed. These farm plans set aside highly erodible lands, prohibit the draining of certain wetlands, and spell out other conservation practices. Funds have been distributed by the USDA for BMP implementation in the upper Salt River, Mammoth Cave, and Fleming Creek watersheds. These areas were chosen as a result of prioritizing streams impacted by agricultural activities. The BMPs consist of such measures as waste lagoons, no- or low-till practices, and streambank stabilization/revegetation. Five demonstration farms have been established in the Mammoth Cave area. In cooperation with the National Park Service and State of Tennessee agencies, the NPS Section has helped develop BMPs to treat acid mine drainage into Bear Creek, a tributary of the South Fork Cumberland River.

Citizen involvement is an important factor in the NPS program. Citizen groups have been formed in several watersheds in response to public perception of water quality problems. These groups can be influential in the public/political arena in promoting BMP implementation and other mitigative measures.

Waterbodies not supporting uses have been evaluated to develop a prioritized list for TMDL development (Table 4). Other waterbodies not meeting water quality standards and not listed in Table 4 are considered to be lower priority. The prioritization was

based on the appropriateness of the TMDL process in addressing the source and pollutants. Table 4 does not reflect relative water quality impairment of the affected waterbodies.

The two areas designated as high priority are the North Fork Kentucky River and Taylorsville Lake. Both waterbodies have received considerable attention from the public and resource agencies in recent years.

The Division has been active in the North Fork Kentucky River basin in an effort to curb bacterial contamination that has been a problem in the basin for several years. Improvements have been made to the three largest municipal dischargers (Whitesburg, Hazard, and Jackson). Monitoring of these facilities, 51 package treatment plants, and the river has been an ongoing activity of the Division. Several synoptic sampling trips were made in the 1992 recreational season. On the most recent one, only 12 percent of the permitted facilities were found to be out of compliance, but not before over $30,000 in fines had been collected from facilities previously in noncompliance. The Division is also cooperating with the Cabinet for Human Resources, Department of Health, in identifying and eliminating illegal straight-pipe discharges that are believed to contribute to the problems in the North Fork Kentucky River.

The 1990 303(d) report identified the upper Salt River basin above the Taylorsville Lake dam as a priority for a watershed or TMDL approach to nutrient control. Taylorsville Lake exhibits oxygen depletion at depths below 8-10 feet in the summer, has experienced fish kills, and is highly eutrophic. Reproduction of gamefish has been poor and the fishery is maintained by an extensive stocking program. Resources of several agencies (USDA, Kentucky Division of Conservation, and the Division of Water) have been used to develop control strategies for NPS contributions in the basin. Several BMPs have been implemented to curb runoff from dairy and other concentrated animal management areas. The Division began an intensive monitoring program in 1991 to document the effectiveness of the BMPs, and to establish the nutrient loading from the subwatersheds and point sources. A total of 12 stream stations are being sampled on a regular basis and during rain events. Composite samples are also being collected from the two primary point sources (the cities of Harrodsburg and Lawrenceburg) at 4-6 week intervals. The monitoring data will be used to identify areas contributing large amounts of nutrients, the temporal differences in those inputs, and the loadings produced by different rain events. Loadings from major point sources will be evaluated to determine if further controls (such as phosphorus removal) would be beneficial. Subwatersheds found to be contributing large nutrient loads will be targeted for BMP implementation.

Several other waterbodies have been designated as medium priority for TMDL development. In most of these areas, work has already begun to address the known water quality problems.

The TMDL process will continue to be used in developing chloride limits for oil and gas facilities, and in limiting new and expanded sewage treatment plants in developed areas. Chloride limits are written to protect not only the immediate receiving stream, but also any downstream water withdrawals. The latter is done by ensuring that the sum of chlorides from all upstream sources is less than the maximum allowable load (with a margin of safety) in a segment with a water withdrawal. Problems arise either when permitted dischargers do not meet limits or discharges occur from unregulated oil and gas operations such as abandoned, unplugged, or illegally operating wells.

The TMDL process for developing WLAs for sanitary wastewater discharges is documented in the State/EPA WLA Agreement. The WLA model considers all point source discharges in a subbasin and is essentially a TMDL for oxygen demanding materials and un-ionized ammonia during critical low-flow conditions. The Division has denied several new discharges in developed areas (i.e. Floyds Fork, Harrods Creek, East Fork Little Sandy River basins) on the basis of WLA modeling results and field verification data. The Division will continue to closely monitor activities in these watersheds.

The Division promotes the regionalization of sanitary wastewater systems to eliminate "package plants," which are often poorly operated. Considerable progress has been made toward this goal. Using the Cabinet's Geographic Information System, maps of 37 selected counties have been prepared in cooperation with the USGS. Local officials will be contacted in these areas to discuss regionalization opportunities and alternatives. Several regionalization projects are currently underway which have eliminated scores of package plants. These areas include:

- Pineville (6-10 facilities),
- Boone County (Sanitation District #1 of Campbell and Kenton counties, 20 - 30 facilities),
- Boyd County south of Ashland (more than 40 facilities),
- Harlan County (2 municipalities and unincorporated areas),
- Hart, Barren, and Edmonson counties (Horse Cave, Cave City, Park City, Mammoth Cave National Park, and 6 private facilities),

- Henry County (consolidation of Eminence and Pleasureville),

- Louisville-Jefferson County MSD (continuing acquisition of numerous package plants),

- Marshall County (Purchase Area Development District assuming ownership of 6 facilities),

- Mt. Vernon (Renfro Valley and 8 private facilities),

- Inez (12 facilities).

Several other regionalization projects are in the planning stage. The Division also requires new and existing facilities in 201 planning areas to connect to available sewer systems.

The watershed approach has also begun to be applied in the upper Dix River basin above the Herrington Lake dam. Herrington Lake is eutrophic to hypertrophic in the headwaters. The Division maintains an ambient monitoring station on the mainstem of the Dix River just above the lake. Total nutrient loading to the lake can be determined from these data. Also, phosphorus monitoring has been placed on the permits of the cities of Danville and Lancaster, the two largest point source dischargers in close proximity to the upper lake. A new USGS gage and Division nutrient sampling is

being established on Clarks Run below Danville to allow loads to be calculated from the urban watershed that is the other major input to the lake. Data from the Danville WWTP will be subtracted to determine loading from sources other than the WWTP. Sampling in the upper rural watershed of the Dix River will eventually be carried out in a manner similar to that being done now in the upper Salt River basin. Lessons learned from the Salt River TMDL process will be applied to the Dix River TMDL. However, it is not expected that a comprehensive sampling program will begin until further work is completed in the upper Salt River basin.

It should be noted that a large number of waterbodies on the original 303(d) lists were there because of poorly operated sewage treatment plants (STPs) or other instances where existing permit limits are adequate to protect water quality, but permit limits were not being met. We have included these affected waterbodies as "water-quality limited," but they do not readily fit into the TMDL concept. The waterbodies listed should meet water quality standards if facilities comply with permit limits. For this reason, such waterbodies are usually listed as "Low Priority," but that does not imply that the Division is not concerned about water quality or that steps are not being taken to address the problems. It means that load development is not the priority. In many instances, facilities known to be the source of instream water quality problems are under enforcement action or are in the process

of constructing new or upgraded facilities in order to comply with existing permits.

Several waterbodies are listed as not supporting uses because of nonpoint source (NPS) pollution, combined sewer overflows (CSOs), and/or urban runoff. The first priority in these instances is to characterize the problem and apply best management practices (BMPs) to control gross pollution. Therefore, waterbodies affected by these sources are not at this time considered to be a high priority for TMDL development.

No TMDL-related activities are planned to specifically address problems on the Ohio River. Because several states lie within the Ohio River watershed, water quality issues in the mainstem are difficult to address. Participation by the member states with coordination from ORSANCO staff is needed. Many of the water quality improvements to tributaries flowing into the Ohio River will have a positive effect on water quality in the mainstem of the Ohio River.

**Table 1**
**List of Streams Not Supporting Uses by River Basin**

| Stream (Waterbody (I.D.) | | Uses Not Supported: Aquatic Life (miles) | Cause | Source | Swimming (miles) | Cause | Source |
|---|---|---|---|---|---|---|---|
| **Big Sandy River Basin** | | | | | | | |
| Tug Fork | (KY5070201-001)<br>(KY5070201-004) | | | | 57.9 | Pathogens | Municipal/<br>Agriculture |
| Big Creek | (KY5070201-005) | 19.7 | Siltation | Agriculture/<br>Mining | | | |
| Knox Creek | (KY5070201-010) | | | | 7.6 | Pathogens | Agriculture |
| Levisa Fork | (KY5070202-001)<br>(KY5070203-010)<br>(KY5070203-016)<br>(KY5070203-021) | | | | 49.5 | Pathogens | Municipal/<br>Agriculture |
| Shelby Creek | (KY5070202-002) | | | | 10.0 | Pathogens | Municipal |
| Russell Fork | (KY5070202-004) | | | | 16.0 | Pathogens | Municipal/<br>Agriculture |
| Elkhorn Creek | (KY5070202-005) | | | | 27.4 | Pathogens | Municipal |
| Paint Creek | (KY5070203-005) | | | | 1.0 | Pathogens | Urban Runoff/<br>Storm Sewers |
| Left Fork<br>Middle Creek | (KY5070203-014) | 9.5 | pH | Mining | 9.5 | pH | Mining |
| Beaver Creek | (KY5070203-018) | | | | 7.0 | Pathogens | Municipal |
| Mud Creek | (KY5070203-022) | 17.0 | Siltation/Organic<br>Enrichment | Agriculture/<br>Mining | | | |
| Big Sandy | (KY5070204-001) | 26.8 | Metals | Unknown | 26.8 | Pathogens | Municipal/<br>Agriculture |

Table 1 (Continued)

Uses Not Supported

| Stream (Waterbody (I.D.) | | Aquatic Life (miles) | Cause | Source | Swimming (miles) | Cause | Source |
|---|---|---|---|---|---|---|---|
| **Little Sandy River Basin** | | | | | | | |
| Little Sandy River | (KY5090104-004) | | | | 39.3 | Pathogens | Municipal/ Agriculture/ Septic tanks |
| East Fork Little Sandy River | (KY5090104-003) | 6.0 | Organic Enrichment | Municipal | | | |
| Shope Creek | (KY5090104-003) | 5.4 | Organic Enrichment | Municipal | | | |
| Newcombe Creek | (KY5090104-009) | 11.9 | Chlorides | Petroleum Activities | | | |
| **Licking River Basin** | | | | | | | |
| Licking River | (KY5100101-001) (KY5100101-004) (KY5100101-034) | 6.3 | Metals | Unknown | 56.4 | Pathogens | Municipal/ Agriculture/ Combined Sewer Overflows |
| North Fork Licking River | (KY5100101-012) | | | | 19.5 | Pathogens | Agriculture |
| Banklick Creek | (KY5100101-002) | | | | 19.0 | Pathogens | Combined Sewer Overflows |
| Three-Mile Creek | (KY5100101-003) | | | | 4.7 | Pathogens | Urban Runoff/ Storm Sewers |
| Lick Creek | (KY5100101-037) | 9.2 | Chlorides | Petroleum Activities | | | |
| Raccoon Creek | (KY5100101-037) | 5.2 | Chlorides | Petroleum Activities | | | |

**Table 1 (Continued)**

**Uses Not Supported**

| Stream (Waterbody (I.D.) | | Aquatic Life (miles) | Cause | Source | Swimming (miles) | Cause | Source |
|---|---|---|---|---|---|---|---|
| Licking River Basin (Continued) | | | | | | | |
| Burning Fork | (KY5100101-038) | 7.5 | Chlorides | Petroleum Activities | | | |
| State Road Fork | (KY5100101-038) | 5.1 | Chlorides | Petroleum Activities | | | |
| Rockhouse Fork | (KY5100101-038) | 5.0 | Chlorides | Petroleum Activities | | | |
| Indian Creek | (KY5100102-009) | | | | 0.6 | Pathogens | Municipal |
| Stoner Creek | (KY5100102-012) | | | | 9.6 | Pathogens | Municipal/ Agriculture |
| Houston Creek | (KY5100102-013) | | | | 14.0 | Pathogens | Agriculture |
| Hancock Creek | (KY5100102-017) | | | | 7.6 | Pathogens | Agriculture |
| Strodes Creek | (KY5100102-017) | | | | 26.5 | Pathogens | Municipal/ Agriculture/ Urban Runoff/ Storm Sewers |
| Brushy Fork | (KY5100102-020) | 5.0 | Nutrients/ Chlorides | Industrial | | | |
| U.T. to Brushy Fork | (KY5100102-020) | 0.2 | Nutrients/ Chlorides | Industrial | | | |
| Hinkston Creek | (KY5100102-024) | | | | 19.8 | Pathogens | Municipal/ Agriculture |

**Table 1 (Continued)**

**Uses Not Supported**

| Stream (Waterbody (I.D.) | | Aquatic Life (miles) | Cause | Source | Swimming (miles) | Cause | Source |
|---|---|---|---|---|---|---|---|
| <u>Kentucky River Basin</u> | | | | | | | |
| North Fork Kentucky River | (KY5100201-002) (KY5100201-005) (KY5100201-008) | | | | 55.1 | Pathogens | Municipal/ Urban Runoff/ Storm Sewers |
| Quicksand Creek | (KY5100201-007) | | | | 20.8 | Pathogens | Agriculture |
| South Fork Quicksand Creek | (KY5100201-007) | | | | 13.8 | Pathogens | Agriculture |
| Spring Fork Quicksand Creek | (KY5100201-007) | 15.0 | Siltation | Mining | | | |
| Lost Creek | (KY5100201-009) | 18.5 | Siltation | Mining | | | |
| Troublesome Creek | (KY5100201-009) | | | | 49.5 | Pathogens | Municipal/Land Disposal |
| Rockhouse Creek | (KY5100201-021) | 24.3 | Siltation | Mining | | | |
| Cutshin Creek | (KY5100202-006) | 28.8 | Oil and Grease/ Siltation | Petroleum Activities/Mining | | | |
| Raccoon Creek | (KY5100202-006) | 7.3 | Oil and Grease/ Siltation | Petroleum Activities/Mining | | | |
| Billey Fork | (KY5100204-009) | 8.1 | Chlorides | Petroleum Activities | | | |
| Millers Creek | (KY5100204-009) | 6.4 | Chlorides | Petroleum Activities | | | |
| Big Sinking Creek | (KY5100204-009) | 14.1 | Chlorides | Petroleum Activities | | | |
| Red River | (KY5100204-013) | 10.0 | Metals | Unknown | 10.0 | Pathogens | Municipal |

**Table 1 (Continued)**

**Uses Not Supported**

| Stream (Waterbody (I.D.) | | Aquatic Life (miles) | Cause | Source | Swimming (miles) | Cause | Source |
|---|---|---|---|---|---|---|---|
| Kentucky River Basin (Continued) | | | | | | | |
| South Fork Red River | (KY5100204-018) | 10.1 | Chlorides | Petroleum Activities | | | |
| Sand Lick Creek | (KY5100204-018) | 5.0 | Chlorides | Petroleum Activities | | | |
| Cat Creek | (KY5100204-017) | 7.7 | Organic Enrichment/ Metals | Source Unknown | | | |
| Eagle Creek | (KY5100205-003) (KY5100205-005) | | | | 38.8 | Pathogens | Source Unknown |
| Kentucky River - Lockport | (KY5100205-011) | | | | 40.9 | Pathogens | Source Unknown |
| Kentucky River - Boonesboro | (KY5100205-047) | | | | 32.7 | Pathogens | Source Unknown |
| Elkhorn Creek | (KY5100205-018) | | | | 17.8 | Pathogens | Source Unknown |
| North Elkhorn Creek | (KY5100205-022) | 2.0 | Organic Enrichment/ Chlorine | Municipal | | | |
| Dry Run | (KY5100205-023) | | | | 7.5 | Pathogens | Municipal/ Agriculture |
| U.T. to North Elkhorn Creek | (KY5100205-025) | | | | 10.8 | Pathogens | Agriculture |
| South Elkhorn Creek | (KY5100205-026) | | | | 17.6 | Pathogens | Urban Runoff/ Storm Sewers |
| Lee Branch | (KY5100205-027) | 1.0 | Organic Enrichment | Municipal | | | |

**Table 1 (Continued)**

**Uses Not Supported**

| Stream (Waterbody (I.D.) | | Aquatic Life (miles) | Cause | Source | Swimming (miles) | Cause | Source |
|---|---|---|---|---|---|---|---|
| <u>Kentucky River Basin (Continued)</u> | | | | | | | |
| Town Branch | (KY5100205-028) | 11.3 | Organic Enrichment/ Metals/ Nutrients | Municipal | | | |
| Clarks Run | (KY5100205-039) | 8.0 | pH/Organic Enrichment | Municipal | | | |
| Silver Creek | (KY5100205-052) | 2.0 | Organic Enrichment/ Nutrients | Municipal | | | |
| Brushy Fork | (KY5100205-052) | 0.2 | Nutrients | Municipal | | | |
| <u>Green River Basin</u> | | | | | | | |
| Nolin River | (KY5110001-010) | | | | 49.2 | Pathogens | Municipal |
| Valley Creek | (KY5110001-012) | 17.5 | Organic Enrichment/ Chlorides | Municipal/ Urban Runoff/ Storm Sewers | | | |
| Doty Creek | (KY5110002-012) | | | | 4.0 | Pathogens | Pasture Land/ Feedlots/ Animal Holding/ Mgt. Areas |
| Patoka Creek | (KY5110002-018) | | | | 4.3 | Pathogens | Pasture Land/ Feedlots/ Animal Holding/ Mgt. Areas |
| Pond Creek | (KY5110003-003) | 23.8 | pH/Metals | Mining | 23.8 | pH | Mining |

Table 1 (Continued)

| Stream (Waterbody (I.D.) | | Uses Not Supported: Aquatic Life (miles) | Cause | Source | Swimming (miles) | Cause | Source |
|---|---|---|---|---|---|---|---|
| **Green River Basin (Continued)** | | | | | | | |
| Mud River | (KY5110003-005) (KY5110003-008) | 64.8 | Priority Organics/ Organic Enrichment | Industrial/ Unknown | | | |
| Green River | (KY5110005-001) (KY5110005-003) (KY5110005-011) | | | | 55.1 | Pathogens | Agriculture/ Urban Runoff/ Storm Sewers |
| Cypress Creek | (KY5110006-002) | 33.3 | pH | Mining | 33.3 | pH | Mining |
| Harris Branch | (KY5110006-002) | 2.6 | pH | Mining | 2.6 | pH | Mining |
| Flat Creek | (KY5110006-005) | 10.6 | pH | Mining | 10.6 | pH | Mining |
| Drakes Creek | (KY5110006-006) | 21.3 | pH | Mining | 21.3 | pH | Mining |
| **Upper Cumberland River Basin** | | | | | | | |
| Cumberland River | (KY5130101-025) (KY5130101-032) | | | | 41.1 | Pathogens | Municipal/ Land Disposal |
| Yellow Creek | (KY5130101-031) | | | | 9.5 | Pathogens | Municipal |
| Cranks Creek | (KY5130101-038) | 15.1 | Siltation/pH | Mining | | | |
| Big Lily Creek | (KY5130103-011) | 2.6 | Chlorides | Industrial | | | |
| Elk Spring Creek | (KY5130103-018) | 1.5 | Organic Enrichment | Municipal | | | |
| Rock Creek | (KY5130104-007) | 4.0 | Metals/pH | Mining | 4.0 | pH | Mining |
| Roaring Paunch Creek | (KY5130104-008) | 15.6 | pH | Subsurface Mining/Surface Mining | | | |

**Table 1 (Continued)**

| Stream (Waterbody (I.D.) | | Uses Not Supported: Aquatic Life (miles) | Cause | Source | Swimming (miles) | Cause | Source |
|---|---|---|---|---|---|---|---|
| **Upper Cumberland River Basin (Continued)** | | | | | | | |
| Bear Creek | (KY5130104-009) | 3.2 | pH | Subsurface Mining/Surface Mining | 3.2 | pH | Surface Mining/ Subsurface Mining |
| **Lower Cumberland River Basin** | | | | | | | |
| North Fork Little River (inc. Upper Branch) | (KY5130205-009) | | | | 18.1 | Pathogens | Municipal/ Agriculture |
| Elk Fork | (KY5130206-002) | 7.0 | Organic Enrichment | Municipal/ Agriculture | | | |
| **Salt River Basin** | | | | | | | |
| Pond Creek | (KY5140102-002) | 17.0 | Unknown Toxicity/ Organic Enrichment/ Metals | Municipal | 17.0 | Pathogens | Municipal |
| Northern Ditch Pond Creek (inc. Fern Creek) | (KY5140102-002) | 10.1 | Unknown Toxicity/ Organic Enrichment/ Metals | Municipal | 10.1 | Pathogens | Municipal |
| Southern Ditch Pond Creek | (KY5140102-002) | 7.1 | Unknown Toxicity/ Organic Enrichment/ Metals | Municipal | 7.1 | Pathogens | Municipal |

Table 1 (Continued)

| Stream (Waterbody (I.D.) | | Uses Not Supported: Aquatic Life (miles) | Cause | Source | Swimming (miles) | Cause | Source |
|---|---|---|---|---|---|---|---|
| Salt River Basin (Continued) | | | | | | | |
| Spring Ditch | (KY5140102-002) | 2.0 | Unknown Toxicity/ Organic Enrichment/ Metals | Municipal | 2.0 | Pathogens | Municipal |
| Fishpool Creek | (KY5140102-002) | 5.4 | Unknown Toxicity/ Organic Enrichment | Municipal | 5.4 | Pathogens | Municipal |
| Knob Creek | (KY5140102-002) | 15.3 | Unknown Toxicity/ Organic Enrichment | Municipal | | | |
| Briar Creek | (KY5140102-002) | 5.7 | Unknown Toxicity/ Organic Enrichment | Municipal | | | |
| Mill Creek | (KY5140102-003) | | | | 13.5 | Pathogens | Municipal |
| Salt River | (KY5140102-005) (KY5140102-029) (KY5140102-031) | | | | 57.5 | Pathogens | Septic Tanks/ Urban Runoff/ Storm Sewers/ Municipal/ Pasture Land/ Feedlots/ Animal Holding/ Mgt. Areas |

**Table 1 (Continued)**

**Uses Not Supported**

| Stream (Waterbody (I.D.) | | Aquatic Life (miles) | Cause | Source | Swimming (miles) | Cause | Source |
|---|---|---|---|---|---|---|---|
| Salt River Basin (Continued) | | | | | | | |
| Town Creek | (KY5140102-033) | | | | 3.2 | Pathogens | Municipal/ Pasture Lands/ Feedlots/ Animal Holding/ Mgt. Areas |
| Floyds Fork | (KY5140102-007) (KY5140102-011) (KY5140102-014) | 13.0 | Organic Enrichment | Municipal/ Urban Runoff/ Storm Sewers/ Flow Regulation | 61.6 | Pathogens | Municipal |
| Cedar Creek | (KY5140102-008) | 15.2 | Organic Enrichment | Municipal | 15.2 | Pathogens | Municipal |
| Pennsylvania Run | (KY5140102-008) | | | | 5.5 | Pathogens | Municipal |
| Brooks Run | (KY5140102-009) | 6.0 | Organic Enrichment | Municipal | 6.0 | Pathogens | Municipal |
| Chenoweth Run | (KY5140102-010) | 9.1 | Organic Enrichment | Municipal | 9.1 | Pathogens | Municipal |
| Pope Lick Creek | (KY5140102-012) | | | | 5.0 | Pathogens | Municipal/ Urban Runoff/ Storm Sewers |
| Long Run | (KY5140102-012) | | | | 9.5 | Pathogens | Municipal/ Agriculture |

**Table 1 (Continued)**

**Uses Not Supported**

| Stream (Waterbody (I.D.) | | Aquatic Life (miles) | Cause | Source | Swimming (miles) | Cause | Source |
|---|---|---|---|---|---|---|---|
| Salt River Basin (Continued) | | | | | | | |
| Beech Creek | (KY5140102-026) | | | | 30.1 | Pathogens | Pasture Lands/ Feedlots/ Manure Lagoons/ Animal Holding/ Mgt. Areas/ Septic Tanks |
| Crooked Creek | (KY5140102-027) | | | | 13.9 | Pathogens | Pasture Land/ Feedlots/ Septic Tanks/ Animal Holding/ Mgt. Areas |
| Ashes Creek | (KY5140102-028) | | | | 10.3 | Pathogens | Pasture Land/ Feedlots/ Animal Holding/ Mgt. Areas |
| Jacks Creek | (KY5140102-028) | | | | 8.0 | Pathogens | Pasture Land/ Feedlots/ Manure Lagoons/ Animals Holding/ Mgt. Areas |

**Table 1 (Continued)**

**Uses Not Supported**

| Stream (Waterbody (I.D.) | | Aquatic Life (miles) | Cause | Source | Swimming (miles) | Cause | Source |
|---|---|---|---|---|---|---|---|
| **Salt River Basin (Continued)** | | | | | | | |
| Timber Creek | (KY5140102-028) | | | | 4.8 | Pathogens | Pasture Land/ Feedlots/ Manure Lagoons/ Animals Holding/ Mgt. Areas |
| Rolling Fork | (KY5140103-001) (KY5140103-005) | | | | 107.4 | Pathogens | Municipal/ Agriculture |
| **Tradewater River Basin** | | | | | | | |
| Crab Orchard Creek | (KY5140205-003) | 22.6 | pH/Siltation | Mining/ Agriculture | 22.6 | pH | Mining |
| Vaughn Ditch | (KY5140205-003) | 3.2 | pH/Siltation | Mining/ Agriculture | 3.2 | pH | Mining |
| Clear Creek | (KY5140205-008) | 28.1 | pH/Siltation | Mining/ Agriculture | 28.1 | pH | Mining |
| Lick Creek | (KY5140205-008) | 18.1 | pH/Siltation | Mining/ Agriculture | 18.1 | pH | Mining |
| Caney Creek | (KY5140205-015) | 11.3 | pH/Siltation | Mining/ Agriculture | 11.3 | pH | Mining |
| Buffalo Creek | (KY5140205-016) | 7.8 | pH/Siltation | Mining/ Agriculture | 7.8 | pH | Mining |

**Table 1 (Continued)**

**Uses Not Supported**

| Stream (Waterbody (I.D.) | | Aquatic Life (miles) | Cause | Source | Swimming (miles) | Cause | Source |
|---|---|---|---|---|---|---|---|
| **Tennessee River Basin** | | | | | | | |
| Cypress Creek | (KY6040006-013) | 19.4 | Unknown Toxicity/ Priority Organics | Industrial | | | |
| **Mississippi River Basin** | | | | | | | |
| Mayfield Creek | (KY8010201-004) | 2.4 | Organic Enrichment | Municipal | | | |
| **Ohio River Tributaries** | | | | | | | |
| Muddy Fork Beargrass Creek | (KY5140101-002) | | | | 6.9 | Pathogens | Municipal/Urban Runoff/ Storm Sewers |
| South Fork Beargrass Creek | (KY5140101-002) | | | | 14.6 | Pathogens | Municipal/Urban Runoff/ Storm Sewers |
| Middle Fork Beargrass Creek | (KY5140101-002) | 2.5 | Organic Enrichment | Urban Runoff/ Storm Sewers | 15.2 | Pathogens | Municipal/Urban Runoff/ Storm Sewers |
| Goose Creek | (KY5140101-003) | | | | 12.2 | Pathogens | Municipal |
| Little Goose Creek | (KY5140101-003) | | | | 8.7 | Pathogens | Municipal |
| Little Bayou Creek | (KY5140206-002) | 6.5 | Priority Organics | Hazardous Waste | | | |
| Mill Creek | (KY5140101-001) | 16.5 | Metals | Urban Runoff/ Storm Sewers | 16.5 | Pathogens | Urban Runoff/ Storm Sewers |

**Table 2**
**Ohio River Waterbodies Not Supporting Designated Uses[a,b]**

| Waterbody | Name | Total Miles | Miles Not Supporting | Cause |
|---|---|---|---|---|
| OVWB16 | Big Sandy R. - Greenup L&D | 23.9 | 23.9 | Metals/Pathogens |
| OVWB17 | Greenup L&D - Scioto R. | 15.5 | ? | Tetrachloroethylene |
| OVWB19 | Meldahl L&D - Little Miami R. | 27.9 | 27.9 | Pathogens |
| OVWB20 | Little Miami R. - Licking R. | 6.1 | 6.1 | Metals/Pathogens |
| OVWB21 | Licking R. - Great Miami R. | 20.9 | 20.9 | Pathogens |
| OVWB22 | Great Miami R. - Markland L&D | 40.4 | 40.4 | Metals |
| OVWB23 | Markland L&D - Kentucky R. | 14.3 | 6.2 | Pathogens |
| OVWB24 | Kentucky R. - McAlpine L&D | 61.0 | 61.0 | Pathogens |
| OVWB25 | McAlpine L&D - Salt R. | 23.1 | 23.1 | Metals |
| OVWB27 | Cannelton L&D - Newburgh L&D | 55.4 | 27.7 | Metals |
| OVWB29 | Green R. - Uniontown L&D | 61.8 | 61.8 | Metals |
| OVWB34 | Tennessee R. - Cairo | 46.5 | 46.5 | Metals |

[a]from ORSANCO (1992)
[b]nonsupport for metals includes biological assessment

**Table 3**
**Lakes Not Supporting Uses**

| Lake | Waterbody | Use Not Supported[a] | Criteria[b] | Cause | Source |
|---|---|---|---|---|---|
| Briggs | KY5110003-008L01 | WAH | 1,2 | Nutrients | Lake fertilization |
| Corbin | KY5130101-006L01 | DWS | 3 | Nutrients | Municipal point sources and Agricultural nonpoint sources |
| Herrington | KY5100205-038L01 | WAH | 2,4 | Nutrients | Municipal point sources and Agricultural nonpoint sources, septic tanks |
| Jericho | KY5140101-006L01 | WAH | 1,2 | Nutrients | Agricultural nonpoint sources |
| Loch Mary | KY5140205-008L02 | DWS | 5 | Metals (Mn) and other inorganics (noncarbonate hardness) | Surface mining (abandoned lands) |
| Mauzy | KY5140202-004L01 | WAH | 1,2 | Nutrients | Lake fertilization |
| McNeely | KY5140102-008L01 | WAH | 1,2 | Nutrients | In-place contaminants (sediments) |
| Sympson | KY5140103-011L01 | DWS | 3 | Nutrients | Agricultural nonpoint sources |
| Taylorsville | KY5140102-025L01 | WAH | 1,2 | Nutrients | Municipal point sources and Agricultural nonpoint sources |

[a]WAH - Warmwater Aquatic Habitat, DWS - Domestic Water Supply
[b]1 - Severe hypolimnetic oxygen depletion
2 - Dissolved oxygen average less than 5 mg/l in epilimnion
3 - Chronic taste and odor complaints caused by algae
4 - Fish kills caused by poor water quality
5 - Chronic treatment problems caused by poor water quality

**Table 4**
**Waterbodies from 303(d) List Prioritized as Candidates for TMDL Development**

| Waterbody Name | Waterbody Number | Miles (Acres) |
|---|---|---|
| HIGH PRIORITY | | |
| North Fork Kentucky River | 5100201-002<br>5100201-005<br>5100201-008 | 55.1 |
| Taylorsville Lake | 5140102-025L01 | (3050) |
| MEDIUM PRIORITY | | |
| Newcombe Creek | 5090104-009 | 11.9 |
| Lick Creek | 5100101-037 | 9.2 |
| Raccoon Creek | 5100101-037 | 5.2 |
| Burning Fork | 5100101-038 | 7.5 |
| State Road Fork | 5100101-038 | 5.1 |
| Rockhouse Fork | 5100101-038 | 5.0 |
| Billey Fork | 5100204-009 | 8.1 |
| Millers Creek | 5100204-009 | 6.4 |
| Big Sinking Creek | 5100204-009 | 14.1 |
| South Fork Red River | 5100204-018 | 10.1 |
| Sand Lick Creek | 5100204-018 | 5.0 |
| East Fork Little Sandy River | 5090104-003 | 6.0 |
| Clarks Run | 5100205-039 | 8.0 |
| Floyds Fork | 5140102-007<br>5140102-011<br>5140102-014 | 61.6 |
| Harrods Creek | 5140101-004 | 31.9 |
| Herrington Lake | 5100205-038L01 | (2940) |